

This Page Is Inserted by IFW Operations  
and is not a part of the Official Record

## **BEST AVAILABLE IMAGES**

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

**IMAGES ARE BEST AVAILABLE COPY.**

**As rescanning documents *will not* correct images,  
please do not report the images to the  
Image Problem Mailbox.**



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/823,403	03/30/2001	Carl D. Burch	10013954-1	8764

7590 07/12/2004

HEWLETT-PACKARD COMPANY  
Intellectual Property Administration  
P.O. Box 272400  
Fort Collins, CO 80527-2400

EXAMINER

LI, AIMEE J

ART UNIT	PAPER NUMBER
----------	--------------

2183

DATE MAILED: 07/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/823,403	<b>Applicant(s)</b> BURCH, CARL D.	
	<b>Examiner</b> Aimee J Li	<b>Art Unit</b> 2183	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 05 April 2004 and 29 April 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-7,9-16 and 18-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7,9-16 and 18-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>4/12/04; 4/29/04</u> . | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. Claims 1-7, 9-16, and 18-20 have been considered. Claims 1, 9, 10, 18, and 19 have been amended as per Applicant's request. Claims 8 and 17 have been cancelled as per Applicant's request.

#### ***Examiner's Note***

2. Applicant has cancelled claims 8 and 17, as indicated by the claim status identifiers. However, cancelled "must be indicated by only claim number and status, without presenting the text of the claims." Please see the accompanying PTO Announcement.

#### ***Papers Submitted***

3. It is hereby acknowledged that the following papers have been received and placed of record in the file: IDS as received on 12 April 2004 and IDS as received on 29 April 2004.

#### ***Information Disclosure Statement***

4. The information disclosure statement filed 12 April 2004 fails to comply with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609 because some of the prior art was previously cited by the Examiner in the Office Action and PTO-892 dated 12 December 2004. It has been placed in the application file, but the information referred to therein has not been considered as to the merits. Applicant is advised that the date of any re-submission of any item of information contained in this information disclosure statement or the submission of any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the statement, including all certification requirements for statements under 37 CFR 1.97(e). See MPEP § 609 ¶ C(1).

#### ***Claim Rejections - 35 USC § 102***

Art Unit: 2183

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1-7, 9-16, and 18-20 are rejected under 35 U.S.C. 102(e) as being taught by Palanca et al., U.S. Patent Number 6,216,215 (herein referred to as Palanca).

7. Referring to claims 1 and 10, Palanca has taught a method for retiring instructions processed through various processing stages (Palanca column 1, lines 10-22 and 46-50) and a computer-readable medium embodying instructions that cause a computer to perform a method for retiring instructions processed through various processing stages (Palanca column 1, lines 31-50; column 5, line 40 to column 6, line 24; column 7, lines 10-50; column 7, line 60 to column 10, line 13; Figure 3; Figure 5; and Figure 6). In regards to Palanca, whether the method is implemented in hardware or software, they are functionally similar. Also, this recitation has not been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951). The method comprising the steps of:

Art Unit: 2183

- a. Processing an instruction capable of early retirement until the instruction meets the criteria for early retirement (Palanca column 8, lines 36-44; column 9, lines 24-59; Figure 5; and Figure 6),
- b. Indicating that the instruction has met the early-retirement criteria (Palanca column 8, lines 36-44; column 9, lines 24-59; Figure 5; and Figure 6);
- c. Processing the instruction to a desirable stage at which, based on the indication the instruction has met the early-retirement criteria, the instruction is terminated out of order of a program running the instruction (Palanca column 8, lines 36-44; column 9, lines 24-59; Figure 5; and Figure 6); and
- d. Updating a state of a system processing the instruction to reflect that the instruction has been terminated (Palanca column 8, lines 36-44; column 9, lines 24-59; Figure 5; and Figure 6);
- e. Wherein the early-retirement criteria is met when the instruction is processed to a point that continued processing of the instruction does not change the architectural state of the system processing the instruction (Palanca column 7, lines 11-18) and, at the time of termination, the instruction has completed its function without completing its full pipeline (Palanca column 8, lines 36-44; column 9, lines 24-59; Figure 5; and Figure 6). In regards to Palanca, the function of an instruction is to provide control signals for the system to know what steps to take when executing an instruction. Palanca shows that once the system is aware of the instruction signals a decoded instruction produces, the instruction may be retired if it does not change the architecture state of the system without the full

Art Unit: 2183

pipeline being executed, i.e. without having the process through the execution phase of the pipeline.

8. Referring to claims 2, 11 and 20, Palanca has taught wherein the desirable stage includes an instruction queue (Palanca column 8, lines 36-44; column 9, lines 24-59; Figure 5; and Figure 6).

9. Referring to claims 3 and 12, Palanca has taught wherein the step of indicating comprises the step of generating a signal associated with the instruction (Palanca column 8, lines 36-44; column 9, lines 24-59; Figure 5; and Figure 6).

10. Referring to claim 4 and 13, Palanca has taught further comprises the steps of:

- a. Sending the signal to an early-retirement unit (Palanca column 8, lines 36-44; column 9, lines 24-59; column 12, lines 38-40; Figure 5; and Figure 6); and
- b. The early-retirement unit arranging for the instruction to be terminated (Palanca column 8, lines 36-44; column 9, lines 24-59; column 12, lines 38-40; Figure 5; and Figure 6).

11. Referring to claims 5 and 14, Palanca has taught wherein the various processing stages include one or more of the following stages: fetching, issuing, sorting, executing, queuing, and retiring (Palanca column 1, lines 31-50; column 5, line 40 to column 6, line 24; column 7, line 60 to column 10, line 13; Figure 3; Figure 5; and Figure 6). In regards to Palanca, the steps of Figures 3, 5, and 6 are functionally similar to those of a pipeline. For example, the Reservation Station would have to fetch an instruction in order to issue it the Memory Ordering Unit. The Memory Ordering Unit sorts the load instruction from the store instructions before sending it to

Art Unit: 2183

the L1 Cache Controller for execution. The Re-Order Buffer and Register Files queues the instructions to be retired and retires them.

12. Referring to claims 6 and 15, Palanca has taught wherein the instruction capable of early retirement includes an identification tag for identifying whether the instruction is capable of early retirement (Palanca column 8, lines 36-44; column 9, lines 24-59; column 12, lines 38-40; Figure 5; and Figure 6). In regards to Palanca, there is an ID for instructions that are senior load instructions.

13. Referring to claims 7 and 16, Palanca has taught wherein NO-OP instructions, pre-fetch instructions, branch instructions, nullified instructions, and predicated-false instructions are identified as instructions capable of early retirement (Palanca column 7, lines 10-50). In regards to Palanca, "senior load instructions" have been defined as instructions that do not update the architectural register state. None of these instructions update the architecture register state.

14. Referring to claims 9 and 18, Palanca has taught wherein the criteria for early retirement are met when continued processing of the instruction does not change the behavior of the program running the instruction (Palanca column 1, lines 31-50; column 5, line 40 to column 6, line 24; column 7, lines 10-50; column 7, line 60 to column 10, line 13; Figure 3; Figure 5; and Figure 6).

15. Referring to claim 19, Palanca has taught a system for retiring instructions processed through various processing stages, comprising:

- a. First processing means for processing an instruction capable of early retirement until the instruction meets the criteria for early retirement (Palanca column 8, lines 36-44; column 9, lines 24-59; Figure 5; and Figure 6);



- b. Second processing means for processing the instruction to a desirable stage at which, based on an indication that the instruction has met the early-retirement criteria, the instruction is terminated out of order of a program running the instruction (Palanca column 8, lines 36-44; column 9, lines 24-59; Figure 5; and Figure 6); and
- c. Updating means for updating a state of the system to reflect that the instruction has been terminated (Palanca column 8, lines 36-44; column 9, lines 24-59; Figure 5; and Figure 6);
- d. Wherein the criteria for early retirement is met when the instruction is processed to a point that continued processing of the instruction does not chance the architectural state of the system (Palanca column 7, lines 11-18), and, at the time of termination, the instruction has completed its function without completing its full pipeline (Palanca column 8, lines 36-44; column 9, lines 24-59; Figure 5; and Figure 6). In regards to Palanca, the function of an instruction is to provide control signals for the system to know what steps to take when executing an instruction. Palanca shows that once the system is aware of the instruction signals a decoded instruction produces, the instruction may be retired if it does not change the architecture state of the system without the full pipeline being executed, i.e. without having the process through the execution phase of the pipeline.

***Response to Arguments***

Art Unit: 2183

16. Examiner withdraws drawing objections in reference to claims 19 and 20 in favor of the claim amendments.

17. Examiner withdraws the drawing objection regarding the instruction queue in view of Applicant's remarks and Applicant's Figure 1.

18. Examiner withdraws claim objections regarding to claims 8, 9, 17, and 18 in favor of the claims amendments.

19. Applicant's arguments with respect to claims 1-7, 9-16, and 18-20 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

20. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

21. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


Art Unit: 2183

22. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aimee J Li whose telephone number is (703) 305-7596. The examiner can normally be reached on M-T 7:30am-5:00pm.

23. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Chan can be reached on (703) 305-9712. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

24. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AJL  
Aimee J. Li  
July 8, 2004



EDDIE CHAN  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2100